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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,834	06/27/2003	Kouji Nakahara	NIT-379	4822

7590 05/19/2004

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EXAMINER

DICKEY, THOMAS L

ART UNIT PAPER NUMBER

2826

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,834

Applicant(s)

NAKAHARA ET AL.

Examiner

Thomas L Dickey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 10-18 is/are rejected.
- 7) ☒ Claim(s) 3,6-9,19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Mail Date 06/27/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on 01/02/98 is acceptable.

Drawings

2. The formal drawings filed on 27 June 2003 are acceptable.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The Information Disclosure Statement filed on 27 June 2003 has been considered.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 1,4,10,12, and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over ITAYA et al. (Electronics Letters, vol. 18, No. 23, Nov. 1982, pp. 1006-1008) in view of ALAVI et al. (4,599,728).

Itaya et al. discloses a buried type laser optical semiconductor device with an InP substrate; a plurality of layers, stacked on the InP substrate, including a GaInAsP active layer stacked on the plurality of layers; an InGaAsP layer including a grating with a composition wavelength not shorter than 1.15 micron and not longer than 1.24 micron stacked on the InAlAs electron stopping layer, and an InP cladding layer stacked on the InGaAsP layer including the grating, wherein impurity dopants including Si and/or O exist between the InP cladding layer and the InGaAsP layer including the grating; wherein a concave depth of the grating included in the InGaAsP layer is smaller than a thickness of the InGaAsP layer and the InP cladding layer has a shape of a ridge mesa stripe. Note figure 1 of Itaya et al. Itaya et al. does not disclose a multi-quantum well active layer made of InGaAlAs or an InAlAs electron stopping layer.

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However, Alavi et al. discloses an optical semiconductor device with a multi-quantum well active layer 30 made of InGaAlAs and a p+ InAlAs electron confinement, or stopping layer 40. Note figure 1 and column 3 lines 54-61 of Alavi et al. Therefore, it would have been obvious to a person having skill in the art to replace the GaInAsP active layer of Itaya et al.'s optical semiconductor device with the multi-quantum well active layer made of InGaAlAs and InAlAs electron stopping layer such as taught by Alavi et al. in order to precisely tune the emitted frequency within the favored 1.33-1.55 micron optical data transmission and efficiently confine carriers to thus provide better greater quantum efficiency and tighter control over transmission frequencies.

B. Claims 2,5,11, and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over ITAYA et al. (Electronics Letters, vol. 18, No. 23, Nov. 1982, pp. 1006-1008) in view of ALAVI et al. (4,599,728) and SALVATORE et al. (2002/0131466).

Itaya et al. discloses a buried type laser optical semiconductor device with an InP substrate; a plurality of layers, stacked on the InP substrate, including a GaInAsP active layer stacked on the plurality of layers; an InGaAsP layer including a grating with a composition wavelength not shorter than 1.15 micron and not longer than 1.24 micron stacked on the InAlAs electron stopping layer, and an InP spacer layer stacked on the InGaAsP layer including the grating, wherein impurity dopants including Si and/or O exist between the InP spacer layer and the InGaAsP layer including the grating; wherein a concave depth of the grating included in the InGaAsP layer is smaller than a thickness of the InGaAsP layer and the InP spacer layer has a shape of a ridge mesa stripe. Note

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figure 1 of Itaya et al. Itaya et al. does not disclose a multi-quantum well active layer made of InGaAlAs, an InAlAs electron stopping layer, or an InGaAsP etch stopping layer stacked on the InP spacer layer and an InP cladding layer stacked on the InGaAsP etch stopping layer.

However, Alavi et al. discloses an optical semiconductor device with a multi-quantum well active layer 30 made of InGaAlAs and a p+ InAlAs electron confinement, or stopping layer 40. Note figure 1 and column 3 lines 54-61 of Alavi et al. Therefore, it would have been obvious to a person having skill in the art to replace the GaInAsP active layer of Itaya et al.'s optical semiconductor device with the multi-quantum well active layer made of InGaAlAs and InAlAs electron stopping layer such as taught by Alavi et al. in order to precisely tune the emitted frequency within the favored 1.33-1.55 micron optical data transmission and efficiently confine carriers to thus provide better greater quantum efficiency and tighter control over transmission frequencies. Further, Salvatore et al. discloses an optical semiconductor device with an InGaAsP etch stopping layer 40 stacked on a InP spacer layer and an InP cladding layer 38 stacked on the InGaAsP etch stopping layer 40. Note figure 2 and paragraphs 31-32 of Salvatore et al. It would further have been obvious to a person having skill in the art to augment Itaya et al.'s optical semiconductor device with the InGaAsP etch stopping layer and InP cladding layer stacked on the InGaAsP etch stopping layer such as taught by Salvatore et al. in order to consistently provide a weak refractive index to reduce higher order optical modes to thus provide better wavelength control and yield.

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C. Claims 15,16,17, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over ITAYA et al. (Electronics Letters, vol. 18, No. 23, Nov. 1982, pp. 1006-1008) in view of ALAVI et al. (4,599,728), as applied to claims 1 and 14 above, or over ITAYA et al. (Electronics Letters, vol. 18, No. 23, Nov. 1982, pp. 1006-1008) in view of ALAVI et al. (4,599,728) and SALVATORE et al. (2002/0131466) as applied to claims 2 and 13 above, and further in view of NODA et al. (4,811,353).

Itaya et al., Alavi et al., and Salvatore et al. disclose or suggest every element of claims 15,16,17, and 18 except that the optical semiconductor device is an integrated light source in which a laser structure and an electro-absorption modulator are integrated. Note figure 1 of Itaya et al., figure 1 and column 3 lines 54-61 of Alavi et al., and figure 2 and paragraphs 31-32 of Salvatore et al. However, Noda et al. clearly show an optical semiconductor device that is an integrated light source in which a laser structure and an electro-absorption modulator are integrated. Note figure 5 and column 4 lines 37-58 of Noda et al. Therefore, it would have been obvious to integrate the laser of Itaya et al., Alavi et al., and Salvatore et al. into an optical semiconductor device in which a laser structure and an electro-absorption modulator are integrated to modulate light lasing stably in the laser region by a voltage applied to the electro-absorption modulator to thus impress a signal, readable at long distances, to the stable laser output to thus allow the optical semiconductor device to be usable in a communication device.

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Allowable Subject Matter

7. Claims 3,6-9, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

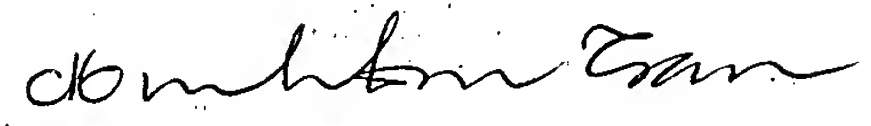
Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 703-308-6601. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TLD
04/2004


Minhloan Tran
Primary Examiner
Art Unit 2826